HELP ME, I'VE FALLEN…

Strategic Analysis of Community Risk Reduction Course

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An applied research project submitted to the National Fire Academy as part of the Executive Fire Officer Program

March 1999

TABLE OF CONTENTS

ABSTRACT

The Henderson Fire Department (HFD) provides emergency medical service in Henderson, Nevada. The problem was that the elderly suffer injury and death from a preventable occurrence: falls. The purpose of this research project was to determine whether HFD members felt that injury prevention is desirable for their department and to measure their willingness to undertake preventive interventions.

These research questions directed the study:

1.) Are the City of Henderson Fire Department members willing to participate in an injury prevention program to reduce fall injuries to seniors?

2.) What do the Henderson Fire Department members believe are the causes of falls to seniors?

3.) Does current literature suggest that preventive interventions can reduce the frequency of falls to seniors?

The research method was descriptive and historical. The survey instrument analyzed Henderson Fire Department members' willingness to participate in injury prevention. It explained the problem in terms of historical data on fall injuries and population trends.

The procedures were 1) an assessment of the problem nationally by reviewing current research 2) a survey of HFD members to identify their willingness to participate in fall prevention.

About ninety percent of HFD members were willing to participate in various fall interventions, either on or off duty. The rankings of fall causes, in

order of frequency, were: weakness, environmental hazards, cognitive impairment, foot problems, balance, orthostatic hypotension, gait, drug effects, and alcohol/drug use. Studies indicate that the risk factors can be identified. By reducing or eliminating them, falls will be reduced and their severity lessened.

The recommendations were that the HFD should institute a senior fall prevention program to include the following:

- Train the firefighters.
- Build coalitions.
- Investigate grant opportunities.
- Utilize public relations and public education to raise awareness.
- Include fall risk factors in the HFD EMS database.

INTRODUCTION

The Henderson Fire Department (HFD) provides emergency medical service including paramedic rescue and transport to the citizens and visitors of the city of Henderson, Nevada. This service is also delivered in parts of Clark County on the north and west borders of the city in accordance with an automatic aid agreement with Clark County.

Reducing the incidence of injury to the client base is one goal of the Henderson Fire Department. The Henderson Fire Department mission statement reads, in part:

- "We are dedicated to customer service, both internally and externally.... We will always consider the benefit of our services to those whom we serve."
- "We shall provide complete Emergency, Fire and EMS service for the community. We will be innovative in learning and embracing new technologies and services..."
- "Fire prevention is not a concept, it is a reality. We believe in…providing non-emergency support services designed to provide a safe community" (Henderson Fire Department [HFD], 1998, p.1).

The senior population is growing both in actual population numbers and as a percentage of the total population.

Problem Statement

The problem is that an important portion of the population, the elderly, suffers injury and death from a preventable occurrence: falls. Falls are the third leading cause of death for Americans over 65 years of age. As many as 30 percent of Americans over 60 suffer falls each year. Many times injury from falls leads to permanent disability (AgeNet, 1999, p. 1). Many falls can be prevented.

The purpose of this research project is to determine whether the City of Henderson Fire Department members feel that injury prevention is a desirable activity for their department to undertake and to measure their willingness to undertake preventive interventions. Another goal is to recommend a strategy to reduce fall injuries to seniors in which the Henderson Fire Department plays a key leadership role.

Research Questions

In order to accomplish the goals of the research, the following questions helped to direct the study.

Research Question #1:

Are the City of Henderson Fire Department members willing to participate in an injury prevention program to reduce fall injuries to seniors?

Research Question #2:

What do the Henderson Fire Department members believe are the causes of falls to seniors?

Research Question #3:

Does current literature suggest that preventive interventions can reduce the frequency of falls to seniors?

Research Method

The research method is descriptive in that the survey instrument provides insight into the current attitudes of the Henderson Fire Department members regarding their willingness to provide injury prevention activities.

The research method is historical in that it explains the problem in terms of historical data on fall injuries and population trends.

BACKGROUND AND SIGNIFICANCE

The problem is not new. It has been with us since ancient times. Several sociological and demographic trends have caused the problem to increase. The senior population is growing nationally. This is a result of baby-boomers maturing. The growth figures show an increase in people over the age of 65 from 4 percent in 1900, to 12 percent in 1993 and to an estimated 20 percent in 2030 (Thompson, 1999, p.2).

Many recent studies have been conducted to analyze the causes of falls; some recommend preventive measures and others test interventions. The extent and severity of the problem was previously unknown to the author and may not be recognized locally as a significant opportunity to alter or improve senior life expectancy and quality.

The author's attention was drawn to the issue by two primary causes:

1) A perceived rise in the number of EMS calls to assist elderly persons who had fallen and either needed assistance getting up or required medical treatment and transport to a medical facility to treat injuries resulting from the fall.
2) Attendance/participation in the executive fire officer course Strategic Analysis of Community Risk Reduction (SACCR) at the National Fire Academy in Emmitsburg, Maryland.

In the SACRR course, student awareness toward the need for injury prevention is developed. A model for developing an injury prevention program is recommended. One of the steps in the prevention program model is to assess the attitudes of the people who will be called upon to implement the program. If these people do not recognize that a problem exists or are unwilling to participate in the activities necessary, the organization will need to do significant preparatory work before introducing the new program.

Fall injuries affect many groups in our culture. The greatest impact is on the senior population at risk of serious injury or death. They suffer physical and emotional trauma from falls and fear of falling. Their families and loved ones are affected emotionally and financially by each event. The medical community must devote significant resources to injury treatment and rehabilitation. Emergency service providers such as the Henderson Fire Department provide resources to assist the fallen. No fees are charged by the HFD unless a transport is provided, so there is also a financial and manpower cost of providing service for an occurrence that might have been prevented.

Unless community resources unite to focus on this problem, a growing number of lives will be lost. More seniors will be incapacitated and institutionalized. Families will suffer economically and emotionally in ever-growing numbers and the medical community and emergency responders will feel the increased burden of injury.

By developing the community's awareness of the extent of the problem and coordinating a coherent intervention strategy, the Henderson Fire Department can become a recognized change agent in improving the quality of life for the senior population of Henderson and Clark County, Nevada. These activities will strengthen the public's perception of the value of the fire service and demonstrate our commitment to the good of saving lives and reducing human suffering. Personal satisfaction will accrue to the participating members of the Henderson Fire Department and to the executive fire officers who lead it and promote this customer based initiative.

Seniors are politically active and their support of the fire department can mean the difference when a tax-based funding issue arises. One of the most valuable benefits will be the knowledge that our actions have saved someone from a life or immobility or worse - the loss of a precious life.

LITERATURE REVIEW

Death and injury as a result of falls are a serious problem in the United States. In 1995, more deaths as a result of falls were recorded -12,313 - than in any other developed country (National Safety Council [NSC], 1995, p. 9). Falls

comprised 14.2 percent of all accidental deaths in the United States in 1995, second only to motor vehicle accidents (48.7 percent) as a cause of accidental death (NSC, 1995, p. 139).

Death rates from falls in the U.S. have been increasing since 1986. For the fourteen years prior to 1986 the death rate from falls had been consistently declining. In 1974, the death rate from falls was 7.7 per 100,000. By 1986 it had dropped to 4.8. In 1996 the death rate from falls had risen to 5.3 per 100,000 (NSC, 1997, p. 45).

In Nevada in 1994, 56 people died as a result of falls compared to 21 who died as a result of fires. Nationally the deaths were 13,450 from falls compared to 3,986 from fire (NSC, 1997, p. 26).

Problem Impact

As Americans age their risk of death from falling increases dramatically. In 1994, the death rate from falls for people age 45 to 54 was 2.0 per 100,000. Ages 55-64 had a death rate of 3.9 per 100,000. Seniors from 65 to 74 suffered from a fall death rate of 8.6 per 100,000. By age 75 the highest rate of accidental death was due to falls - 62.3 per 100,000 - higher than the next four causes combined (NSC, 1997, p. 12).

About thirty to forty percent of people age 65 and older who live at home will fall each year (Hinman, 1998, p.72; Tibbets, 1996, p. 24). About 10,000 older adults die each year from falls. Nearly fifty percent of the elderly who are hospitalized due to a fall will die within twelve months of their injury (Tideiksaar, 1998, p. 8).

Injuries from falls include head injury, fractures, soft-tissue injury, musculoskeletal sprains, and lacerations. The most common fractures are those of the distal forearm and hip.

About five percent suffer a bone fracture and one percent a hip fracture. This results in 250,000 to 280,000 hip fractures annually in the United States (Tibbets, 1996, p. 24; Kaufman, 1997, p. 41).

Fear of falling can often lead not only to psychological distress but also to reduction of activity and an unnecessary and undesirable loss of independence. (Yardley, 1998, p.23) Up to fifty percent of people who fall avoid activities of daily living (ADLs) because they fear additional falls and injury" (Tideiksaar, p. 13).

The elderly who fall are ten times more likely to be hospitalized and eight times more likely to die than children who fall (Tibbets, 1996, p. 24).

Financially, the cost of caring for falls among the elderly has been estimated at $12.4 billion per year. Hospitalization from falls often results in nursing home placement. Forty percent of nursing home admissions result from falls (Tibbets, 1996, p. 24).

Tibbets (1996) states that falls at home are often related to host factors. When the elderly have a combination of hip weakness, balance impairment, and are taking medication their risk of falling is close to one hundred percent (p. 25).

Evaluations and Interventions

Tibbets recommends evaluation of at-risk seniors. He suggests checking the home for problems like poor lighting, slippery floors and surfaces that

produce a glare. Unsafe stairs and furniture should be modified (Tibbets, 1996, p. 25). The patient should be evaluated for the following:

- Blood pressure while sitting or lying and again 1, 2 and 5 minutes after standing to reveal orthostatic hypotension
- Corrected vision should be 20/70 or better
- Foot problems that include painful bunions, poor fitting, or slippery footwear
- Balance and strength assessment using the "Get up and go" test [described] (Tibbets, 1996, p. 27).

Tideiksaar (1998) recommends using the Performance Oriented Environmental Mobility Screen (POEMS) to assess fall risk in the clinical setting (p. 49). For gathering information regarding a fall Tideiksaar suggests the fall components represented by the acronym SPLATT:

- Symptoms experienced at time of fall(s)
- Previous number of falls or near falls [during previous six months]
- Location of falls
- Activity engaged in at time of fall(s)
- Time (hour of day) of fall(s)
- Trauma (physical, psychological) associated with falls (p. 87).

Tibbets (1996) has developed a questionnaire to assist in the evaluation of risk factors for a fall. (p. 26) The questionnaire is located in Appendix A.

Kaufman (1997) attributes environmental conditions and structural hazards as the cause of as many as half of all falls (p.42). This is in contrast to Tibbets' (1996) figure of twenty-two percent of falls caused by environmental

factors (p. 25). Environmental modifications are discussed extensively by Tideiksaar (1998). Refer to his book *Falls in Older Persons* as a guide to recommending home improvements.

Kaufman (1997) agrees that psychotropic (affecting psychic function or behavior) medications cause a three-fold increase in the risk of falls. Visual, mental and neurological impairment are significant risk factors. Abnormalities of gait or balance may be improved by enrolling the individual in a program of regular tailored physical exercise (p. 42).

Hinman's (1998) study indicates that most subjects believe their falls were related to intrinsic factors such as dizziness, weakness, or poor balance rather than extrinsic factors such as poor lighting, or loose objects on the floor. They indicated that falls were controllable (preventable) and that the benefits of an exercise program were greater than environmental modifications (p. 71).

By determining each person's perceived cause of a fall episode the health care worker can develop a remediation plan consistent with the victim’s needs (Hinman, 1998, p.74).

Recent studies of fall intervention programs indicate that physical training strategies can improve functional independence by enhancing the fitness levels of older adults and increasing their confidence in performing daily activities. Hinman (1998) concludes that health care providers need to be more proactive in dispelling older adults' misconceptions that they cannot improve their physical performance (p.82).

Nakamura, Holm, and Wilson (1998) evaluated the five most frequently used instruments for determining a senior's ability to balance. They compared the Get Up and Go Test (GUGT), the Falls Efficacy Scale (FES), the Berg Balance Scale (BBS), the Performance Oriented Assessment of Balance (POAB), and the Functional Reach (FR) test (p. 17).

Nakamura et al. (1998) recommended the GUGT and/or the FES as effective screening tools for a fall-prevention program. No special training is needed to administer these tests. The time required to administer the test is three minutes for the GUGT and ten minutes for the FES (p. 25, 26). The GUGT is simple to administer and uses five items designed to challenge an elderly person's sense of balance (Nakamura et al., p. 22). To perform this test the patient must arise from a standard armchair, walk three meters across the room, turn around, walk back to the chair, and sit down (Tibbets, 1996, p.27).

The Falls Efficacy Test (FES) measures the amount of confidence an elderly person has in doing daily tasks without falling. The FES measures the person's perceptions rather than their physical abilities, using a ten item written questionnaire (Nakamura et al., 1998, p. 23).

A separate study determined that there were no significant differences in the FR scores between fallers and non-fallers among community dwelling seniors (Franzen et al., 1998, p. 38). This reduces the validity of the FR test as an evaluation instrument for fall potential.

"One thing that seems to be very clear from the research on falls...is that falls are not accidents. They can be predicted to some extent, and once one can

predict something, preventive intervention can be developed" (Evans, 1992, p. 130).

Exercise

Research suggests that exercise can lead to improvements in balance in the elderly and reduce the risk of falling (Yardley, 1998, p.27).

Participants in an exercise program that met three times per week for one hour per session over a three-month period showed improvements in balance, gait, and confidence. However, at the conclusion of the study none of the participants continued to exercise independently (Reynolds and Garrett, 1992, p. 108,109).

Tai Chi shows promise as a form of exercise that appeals to the elderly. "Tai Chi's slow deliberate movements and mind/body awareness are congruent with the flexibility and balance exercise needs of the older adult" (McNeely, Clements, & Wood, 1992, p. 93).

Summary

The literature review illustrated the extent of fall injuries in the U.S. Clearly more attention should be focused of the second greatest cause of accidental death in America.

The problem will continue to escalate locally as the population increases and the proportion of seniors continues to grow. The mayor of Henderson, James Gibson, proposes that we refocus our efforts toward seniors while the HFD mission statement stresses the importance of customer service.

Numerous interventions were reviewed in the literature. The simpler interventions could be performed at the conclusion of an emergency call. Referrals to outside agencies would be more appropriate for more complex interventions.

Many tools are available to evaluate at-risk seniors. Three very simple, yet effective tools are the GUGT, the FES, and Tibbets' questionnaire. Each of these is appropriate for the emergency responder to utilize as a screening tool. The literature review encouraged the author that practical, effective solutions are available to concerned responders and agencies.

Evans' quote, "One thing that seems to be very clear from the research on falls…is that falls are not accidents. They can be predicted to some extent, and once one can predict something, preventive intervention can be developed," set the stage for the research (Evans, 1992, p. 130).

PROCEDURES

The procedures encompassed two principal areas 1) an assessment of the problem nationally by reviewing and condensing study results, and 2) a survey of the Henderson Fire Department members to identify their willingness to participate in a injury reduction effort with the subject population seniors who have fallen or are at risk of falling.

The survey instrument and a memorandum introducing the survey were delivered to each of fifteen crews across the three work shifts. The survey instrument was administered to all of the on-duty members of the Fire Rescue Operations Division of the Henderson Fire Department from the rank of captain

to firefighter over a three-day period (to cover the three shifts). The total population of 113 was reduced by vacation, illness, shift trade, administrative assignment and absence for training. The on-duty population sampled during the three-day period was 97. The total number of responses was 88 for a response rate of 90%. A copy of the cover memo and survey instrument can be found in Appendix B. The responses are italicized in the appendix.

The national problem assessment was conducted through a literature review and analysis.

Definition of Terms

The following definitions may familiarize the reader with unfamiliar terms.

Cognitive impairment: loss of normal ability to see, hear, or process information

Host factors: a factor within the individual

Extrinsic factors: a factor from outside the individual

Fire Rescue Operations: the division of the Henderson Fire Department that provides emergency fire and medical response

Gait dysfunction: impaired ability to walk smoothly and evenly

Intrinsic factors: a factor within the individual

Orthostatic hypotension: lowered blood pressure that occurs on rising to an erect position

Senior: person age 55 or older

Vector: the agent of energy transfer

Limitations

Ideally, data gathering from local emergency response records would be useful in assessing the local problem. This research is limited because the Henderson Fire Department EMS report only separates falls into two categories: falls from less than 20 feet, and falls from more than 20 feet. Another limiting factor is that retrieval of data from the record management system using two sets of variables is virtually impossible without a review of every report.

A limitation in the survey results is caused by two problems with the ranking of causes of falls. Some respondents remarked that there were overlapping categories. Other respondents only rated five of the nine categories because the rating scale only went from one to five. For those respondents the categories not rated were given a score of zero. One respondent rated the categories from one to nine. That portion of his response was excluded from the results because the author could not determine the meaning of that set of scores.

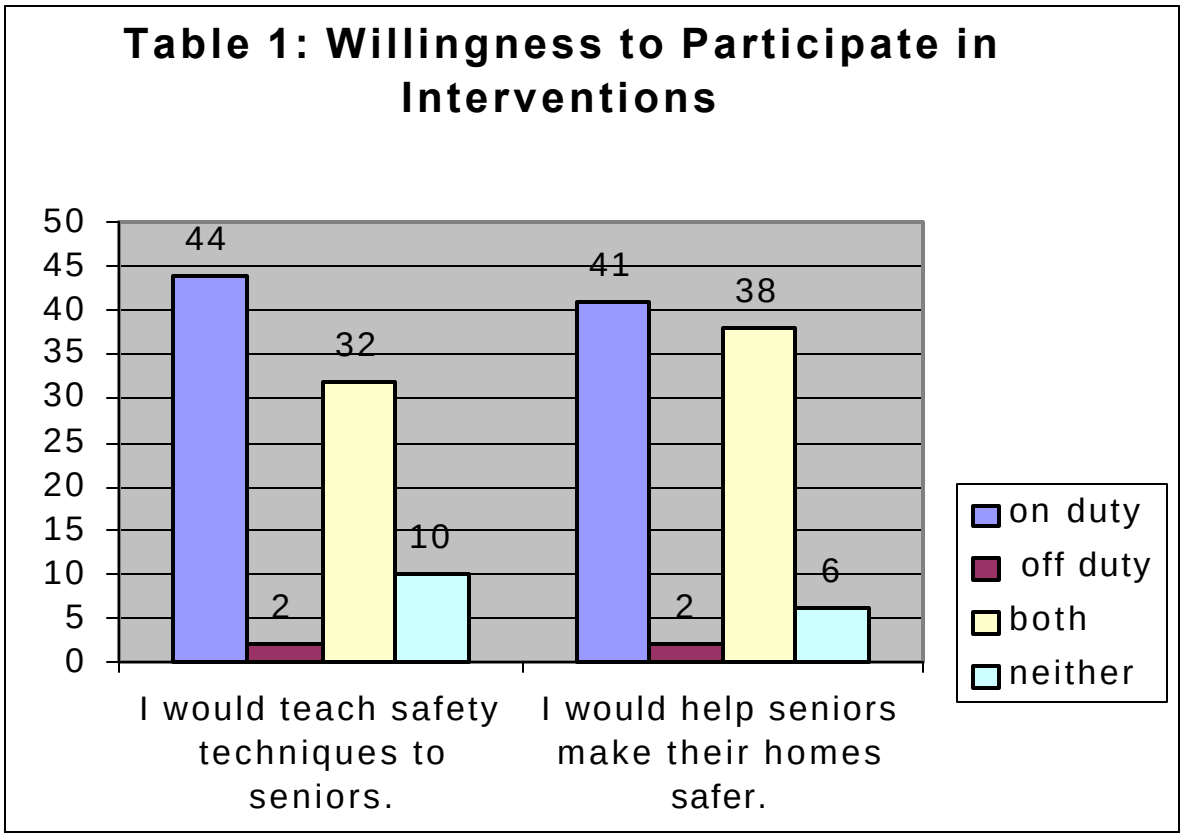
One respondent commented that he felt the questions were slanted.

RESULTS

The results of the opinion survey of the Henderson Fire Department members indicated that most respondents, 84 percent, believe their department should become more active in injury prevention. Half (50 percent) believe the senior population is growing faster than the average population rate. Nearly as many, 43 percent are unsure of the senior population growth rate.

Most members are willing to invest time teaching safety techniques to seniors. Fifty percent would teach on duty; three percent would teach off duty.

Thirty two percent would be willing to teach both on and off duty. Eleven percent were unwilling to teach safety techniques to seniors.



Henderson Fire Department members are willing to invest their time helping seniors to make their homes safer. Forty seven percent would help on duty, three percent off duty. Thirty eight percent would help both on and off duty. Just seven percent do not choose to help seniors make their homes safer.

More than nine out of ten respondents, ninety one percent, are willing to document the causes of seniors' falls and recommend interventions to other agencies. Eight percent did not choose to document and refer fall causes to other agencies. One respondent did not answer this question.

See Appendix B for the responses to the closed-end questions.

The survey respondents rated a list of risk factors using scores from 1 to 5, with 5 being the most frequent cause. Mean scores for each risk factor were determined by taking the risk factor and multiplying the number of responses times the number value of the response. The summation of these products was then divided by the total number of responses to produce the mean score for that risk factor.

The most frequent rated cause of falls was believed to be "weakness". It had a mean score of 3.76 on a five point scale with five being the most frequent cause. "Weakness" was followed closely by "environmental hazards" which include rugs, cords, stairs and poor lighting. "Environmental hazards" rated 3.45.

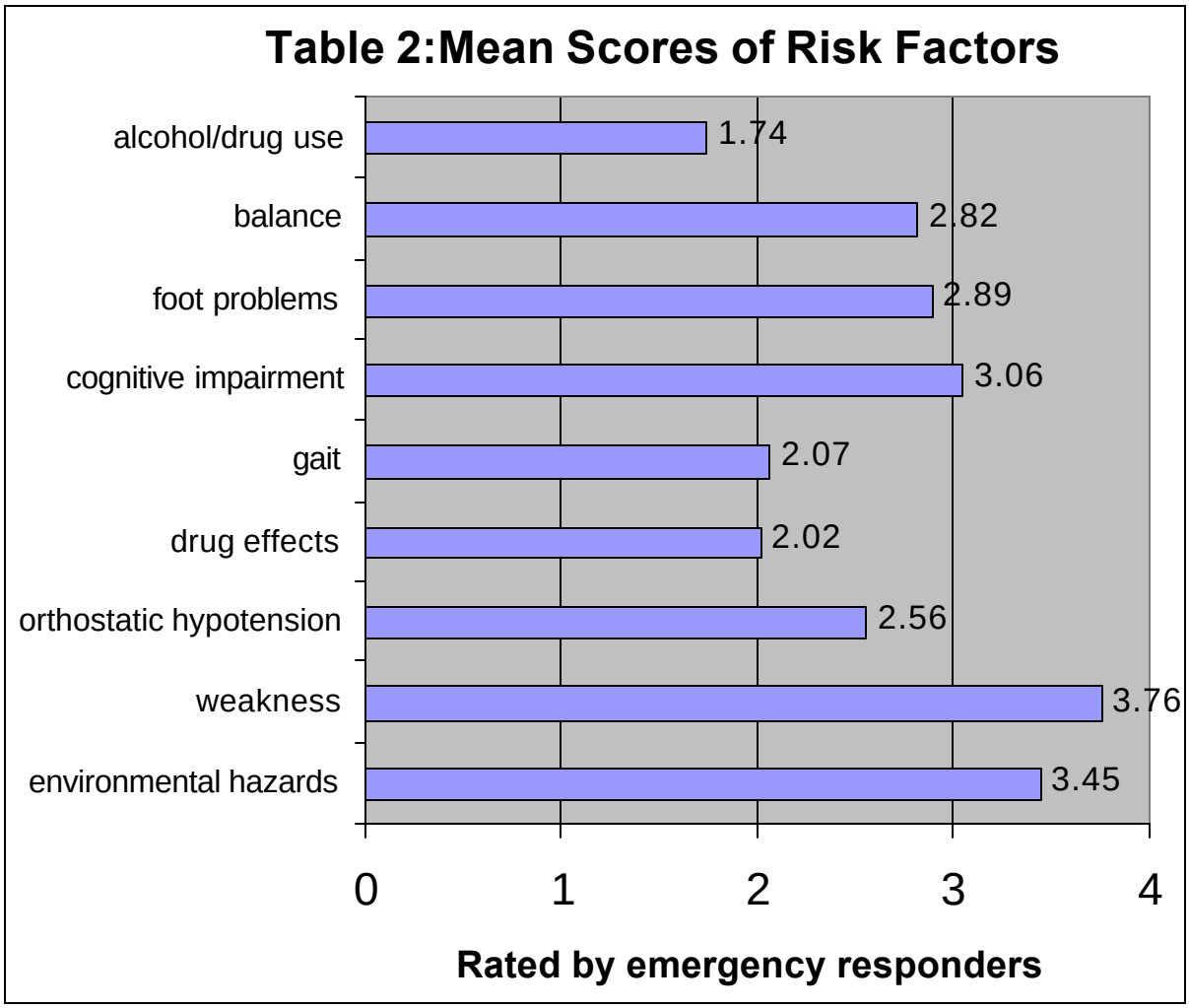
The third and fourth ranked causes were "cognitive impairment (3.06) and "foot and lower extremity problems" (2.89). Cognitive impairment relates to vision, awareness and judgement limitations.

"Balance" (2.82) was the fifth most frequent cause of falls in the opinions of the respondents. "Orthostatic hypotension" - a drop in blood pressure caused by a change in body position- was felt to be sixth in frequency, having a mean score of 2.56.

"Gait dysfunction" (2.07) in which the elderly take small shuffling steps, keeping their feet close together and directly beneath their center of gravity, ranked seventh among causes of falls.

Drug effects (2.02) had a nearly identical score to gait dysfunction and ranked eighth. The least frequent of the causes listed was "alcohol abuse"

scoring 1.74. A distribution of the frequency of responses for the nine fall factors can be found in Appendix C.



The open-ended question "Who would best be able to make a difference in reducing fall injuries to seniors?" elicited the following responses. The family was mentioned thirty-nine times. Caregivers and caretakers were felt to be most effective by seventeen respondents. Thirteen people thought the seniors themselves were best able to reduce their fall injuries. Doctors, nurses, and staff combined for eight responses. Public interest groups, social service agencies,

senior center and AARP (American Association of Retired Persons) combined for six votes. Emergency responders only garnered five votes. Television producers, public service announcements and commercials each had one mention. Four others were mentioned once – “qualified personnel”, “all of us”, “anyone with time”, and “a delivery person”.

The open-ended question, "Is there another area of injury prevention that the Henderson Fire Department should focus on?" generated 67 distinct responses. The seven categories mentioned most frequently (followed by the number of mentions) were: automobile safety (15), child safety (12), home safety (6), fire department on-the-job injury (6), violence/abuse (5), and pool safety (2). For a complete list of the responses see Appendix D.

The final survey question, "Do you have any comments on this survey?" generated 23 responses. Of the responses twelve were positive, ten were neutral, and one was critical. A complete list of the responses can be found in Appendix D.

Research Question Results

The answer to research question #1: “Are the City of Henderson Fire Department members willing to participate in an injury prevention program to reduce fall injuries to seniors?” is yes, the fire department members are willing to participate in an injury prevention program to reduce fall injuries to seniors. Between 89 and 93 percent of the HFD members were willing to participate in various strategies, either on or off duty.

Eighty four percent believe that Henderson Fire Department should become more active in injury prevention.

The answer to Research Question #2: “What do the Henderson Fire Department members believe are the causes of falls to seniors?” is shown in Table 2 [graph of factors]. The rankings in order of frequency are weakness, environmental hazards, cognitive impairment, foot problems, balance, orthostatic hypotension, gait, drug effects, and alcohol/drug use. These responses are relative and are based solely on the opinions of the respondents.

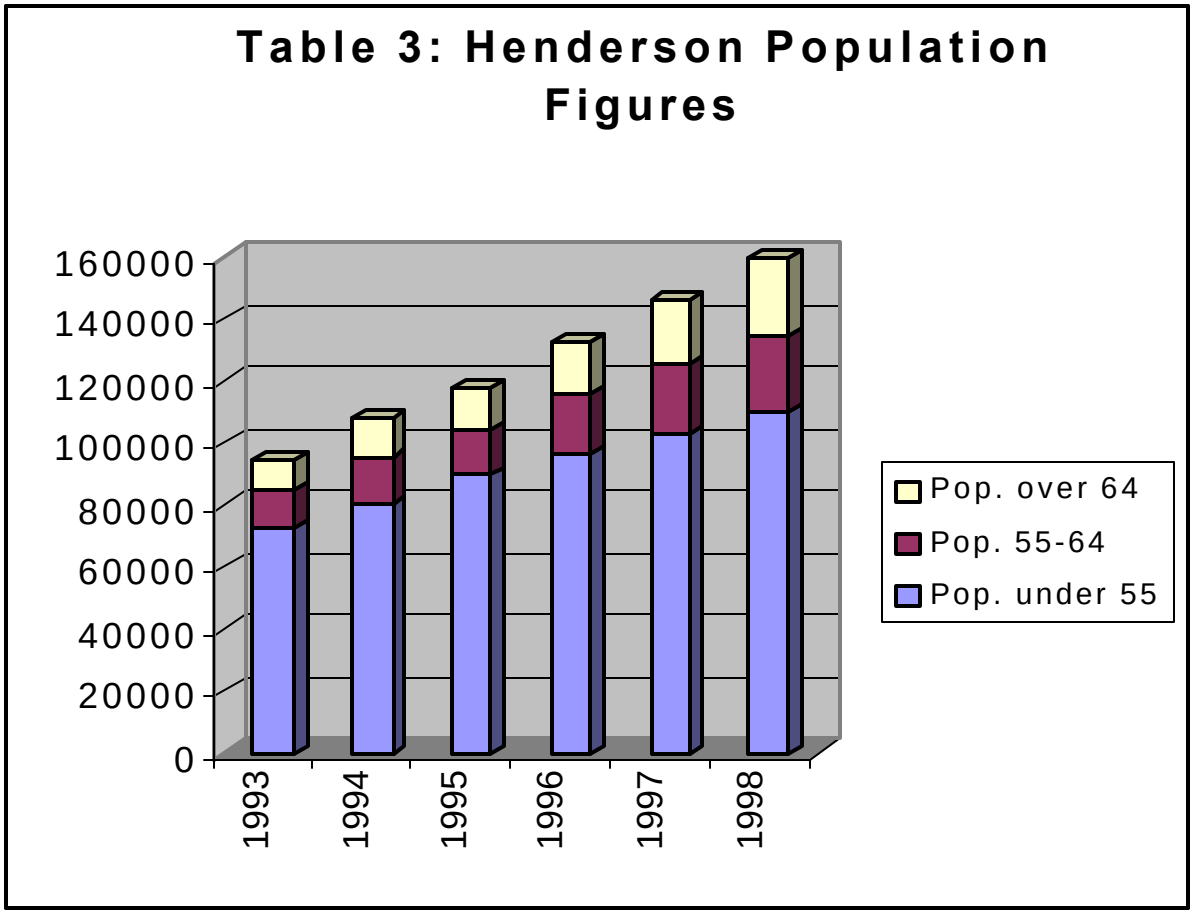
The answer to Research Question #3: “Does current literature suggest that preventive interventions can reduce the frequency of falls to seniors? “ is also affirmative. Studies indicate that the risk factors can be identified and by reducing or eliminating them falls will be reduced and their severity lessened.

Henderson Demographics

The senior population in the City of Henderson has been steadily increasing. The population of seniors aged 55 to 64 has grown from 12,302 in 1993 to 24,958 in 1998. In 1993 the percentage of the population aged 55 to 64 was thirteen percent, by 1998 it had reached sixteen percent. Seniors aged 65 and over increased from 9,464 in 1993 to 24,312 in 1998. This represents a percentage increase from ten percent to fifteen percent (Population, 1999, p.1).

Combining these groups results in a total population of 49,270 or thirty one percent of the population in 1998. This compares to a combined total of 21,766 or twenty three percent of the 1993 population. Appendix E provides the population figures from 1993 to 1998 in Henderson. Henderson Fire Department

emergency response data for calls from 1994 through 1998 indicates that responses due to falls for persons 55 and over ranged from 47 to 50 percent of all fall responses during those years (Fall data, 1998).



Mayor James B. Gibson (1999) in his State of the City message explained that "the increasing number of seniors is challenging us to a new way of thinking about our population". He went on to say "our changing population requires us to change our delivery of services" (p.1).

Las Vegas and Nevada Demographics

"A new study by the National Association of Home Builders found that Nevada will be the nation's most popular market for senior housing over the next

eight years" (Senior Status, p. 1D). By living in Nevada, seniors can avoid state income, inheritance, and gift taxes and enjoy good entertainment value. In 1996, the senior population of Clark county age fifty-five to sixty-four was 15.8% of the population. Seniors 65 and older made up 17.8% for a combined total of 33.6% (Senior Status, p. 2D).

DISCUSSION

An analysis of death statistics shows that deaths from falls in the United States are a serious problem. The U. S. leads developed countries in actual deaths from falls. The domestic death rate has been rising since 1986 (NSC, 1995, p.139). As Americans age they become increasingly susceptible to death and injury resulting from falls. Population statistics show the senior population in Henderson to be 31% of the total, and growing (Population, 1999, p.1).

In the SACCR course the Haddon Matrix was introduced. It describes four causative factors: host, vector, physical environment, and socioeconomic environment (Federal Emergency Management Agency, 1998, p. SM 3-24). Each fall study reviewed for this topic included host and environment as factors and sometimes discussed the vector or activity leading to injury. Socioeconomic factors were not generally analyzed in the studies reviewed. Sometimes poverty or living alone as a result of old age were mentioned as pre-event factors of falls in the socioeconomic category.

Tibbetts (1996) categorizes causes into three factors citing other studies. These are host, activity and environmental (p.25). Tideiksaar (1998) divides the causes of falls into two categories - intrinsic and extrinsic. Intrinsic causes are

those that are related to the individual and include age-related physiologic changes, disease states, and medications and their efforts. Extrinsic factors include hazardous environmental conditions, faulty devices and footwear (p. 20).

Tideiksaar's (1998) factors compare favorably with the risk factors on the survey questionnaire. The two highest rated risk factors - weakness and environmental hazards are manageable with interventions that do not require extensive technical expertise.

Up to fifty percent of people who fall avoid activities of daily living (ADLs) because they fear additional falls and injury" (Tideiksaar, 1998, p. 13). The Older Americans Act of 1965 as Amended (OAA) calls for programs for seniors at risk of losing their independence. This act was passed in response to the needs of the growing senior population.

In 1994, $799 million was allocated to the State Agencies on Aging. Seventeen million dollars of that amount was earmarked for "Disease Prevention and Health Promotion Services". Some categories of program that qualify for this money are: routine health screening; physical fitness programs; health promotion programs on chronic disabling conditions; and home injury control services. (Administration, 1995, p. 1, 3.) One obstacle noted to utilization of these federally funded services was "insufficient collaboration and coordination among agencies" (Administration, p. 4). Having the HFD coordinate a “Fall Injury Reduction” program would help to improve the collaboration and coordination locally.

The results of the survey clearly indicate the willingness and interest of the HFD members to become more active in injury prevention. They recognize the benefits of assisting the elderly, judging from their responses to the open-ended questions and the high rate of acceptance of the idea of participating in several interventions.

Because the fire department so frequently interacts with those at risk of falling, its members have the ability to help maximize the quality of life of our seniors. The HFD can be a unifying factor in the community to organize various stakeholders in tackling this problem. The results of a unified effort could become a model program for other communities.

There are numerous local programs with which the HFD could coordinate. The Nevada Division of Aging Services offers two programs that provide assistance to seniors. The Community Home-based Initiatives Program offers assistance to low-income seniors that are at risk of entering a nursing facility if they do not receive help in the home. This program provides attendants to help with bathing, dressing, meal preparation, and shopping. The Community Ombudsman Program provides advocacy and referral services for seniors needing assistance. The phone number for both these programs in Las Vegas is 486-3545 (Patterson, 1999, p.1E). The national hotline for assistance for older individuals is 1-800-677-1116.

Catholic Charities of Southern Nevada offers the Senior Companion Program and the Respite Care Referral Service that provide assistance and

friendship. To learn more about or apply for these programs call 382-0721 (Patterson, 1999, p.2E).

Part of coordinating a fall prevention program is to recommend strategies to correct risks. Strength training is one area upon which to focus. Thompson discusses the results of several studies using resistance training to improve muscle mass and flexibility. (Thompson, 1999, p. 6-10)

The benefits of maintaining or improving strength in the elderly may include correction of gait disturbances and safer ambulation, prevention of falls, reduction in bone fractures, improved mobility and stamina, improved performance of activities of daily living and increased capacity for independent living (Thompson, 1999, p.10).

"The ultimate goal of evaluation and treatment of elderly people is not just a reduction in falls, but more importantly, a decrease in the number of injuries" (Tibbets, p. 28).

Another area of focus is environmental modifications. AgeNet lists nine home modifications to increase safety and deter falls.

- Clear pathways of clutter and electrical cords.
- Firmly attach carpets and rugs.
- Rearrange furniture so they are not obstacles.
- Use raised seat and safety rails for toilet.
- Install sturdy handrails on both sides of stairway.
- Paint the top and bottom stair to show contrast with the other stairs.
- Keep outdoor steps and walkways in good repair.

- Utilize grab bars and a chair in the tub.
- Provide adequate lighting. (AgeNet, 1999, pp. 1,2)

Many interventions are available to reduce the likelihood of senior falls. The areas where the Henderson Fire Department can be most effective is in recognizing muscular weakness as it manifests itself in gait dysfunction and identifying environmental hazards. The emergency responders interact with those at the highest risk of falling and are very capable of providing assistance, either by removing an environmental hazard or by referring the victim to another agency that specializes in correcting a specific problem area.

RECOMMENDATIONS

The Henderson Fire Department should institute a fall prevention program for residents, 55 years of age and over. The program would be most effective if the following conditions were met.

- Train the firefighters.
- Build coalitions.
- Investigate grant opportunities.
- Utilize public relations and public education opportunities to raise awareness.
- Expand the HFD record management system to include the risk factors for falls.

The firefighter training is necessary to build momentum by raising their awareness of the extent of injury caused by falls and develop their skill at recognizing and evaluating risk factors. The firefighters need to be skillful in

administering the Get Up and Go Test and the Falls Efficacy Scale. They should learn which environmental factors are desirable and which pose a risk.

Coalitions should be developed to include qualified and interested groups that can leverage the effectiveness of the Henderson Fire Department by adding capable and willing help. Some agencies that might be included are the American Association of Retired Persons (AARP), Henderson Senior Center, Clark County Social Services, Catholic Charities of Southern Nevada and the Retired Senior Volunteer Program (RSVP). Other parties to consider would be local scouting groups, the local media to develop a public relations campaign and the University of Nevada, Las Vegas nursing program. The author Rein Tideiksaar also lives in the Las Vegas area and would be an invaluable resource. Physical therapists' organizations would be another group with a professional interest in the program.

Some of the benefits of grant research would be the possibility of procuring funds for a coordinator or specialist to oversee the program. Another area of investigation would be funding for home improvements. The City of Henderson is currently active in this area through its Housing Rehabilitation Specialist.

The fall prevention program should be offered to every senior fall victim. It should be publicized using public service announcements (PSAs) and through participation in health fairs, and the Henderson Expo (an annual local event). Outreach to senior organizations, the Henderson Chamber of Commerce and

other civic groups would build grassroots support and awareness of the problem and our plans to reduce its impact on the community.

Expanding the records management system (RMS) by adding risk factors for falls would enable the HFD to more effectively identify persons at-risk of falling. It would also facilitate tracking interventions and their effects. One of the critical issues in implementing an injury prevention program is the ability to track the results of the program. Modifying the RMS is vital to measuring program results.

A comprehensive organized plan involving all the stakeholders can result in a dramatic improvement in senior safety.

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APPENDIX A: Form-OFFICE STAFF EVALUATION OF PATIENT FALLS

Date:_____

Patient name:_____ Age: _____ Gender: M F

Risk factors (circle answers)

1. **Previous falls:**
   yes (last fall date: _____)
   no
2. **Medications:**
   a. four or more Rxs
   b. new Rx (last two weeks)
   c. any of the following types: tranquilizers, sleeping pills, antidepressants, antihypertensives, antidiabetic agents
3. **Gait problem or weakness**
   yes
   no
4. **Dizziness, vertigo, loss of consciousness**
   yes
   no
5. **Environmental problems:**
   Lighting flooring other_____
6. **Major illnesses:**
   CNS musculoskeletal neurologic heart new acute illness other_____

Questions to ask patient or family

1. What was happening before the fall occurred?_____
2. Any injuries? Cut pain sprain/strain fracture other_____
3. How is patient feeling now? Mentally walks without pain
4. Check temperature_____ pulse_____ BP_____
5. Who is available to help the patient? Spouse family member friend none

Nurse's name:_____ Time:_____

Falls producing injuries(such as cuts, fractures, loss of activity or mentation) or falls caused by a new acute illness, loss of consciousness, fever, or BP abnormalities require the patient to be seen immediately. Less serious falls may await the physician's direction.

Physician response:

_____

_____

_____

Source: Prepared for GERIATRICS *by G. Michael Tibbets, MD*

APPENDIX B: Cover Letter and Injury Survey Form

Memorandum

To: Henderson Fire Department, Fire Rescue Operations personnel

From: Division Chief Gene Belin

Date: 6/14/00

Re: Opinion Survey

I have attached an opinion survey to determine the general attitude of the Fire Rescue Operations Personnel toward injury prevention in the community. The specific area I seek to learn more about is your attitudes toward participating in a plan to reduce the number of injuries to seniors that result from falls, especially those in the home.

I am currently enrolled in the Executive Fire Officer program at the National Fire Academy. The course I am currently completing is Strategic Analysis of Community Risk Reduction. One intention of the course is to raise the awareness of the fire service in reducing injury in the local community.

The findings from this study will be included in a research paper I will submit to the National Fire Academy. Your candid replies will provide an important look at our level of awareness of this problem and our interest in becoming more actively involved in reducing these injuries.

I appreciate your careful consideration of the following questions.

APPENDIX B: Injury Survey

I believe the Henderson Fire Department should become more active in injury prevention in the local community. AGREE DISAGREE

84% *14%* *no answer:2%*

The senior population in Henderson is growing faster than the average population rate?

AGREE DISAGREE DON'T KNOW

50% *7%* *43%*

IF THE HENDERSON FIRE DEPARTMENT COULD REDUCE INJURIES TO SENIORS THAT RESULT FROM FALLS IN AND AROUND THE HOME…

a.) I would be willing to invest some of my time to teaching safety techniques to seniors.

ON DUTY OFF DUTY BOTH NEITHER

50% *3%* *32%* *11%*

b.) I would be willing to invest some of my time to helping seniors make their homes safer. ON DUTY OFF DUTY BOTH NEITHER

47% *3%* *43%* *7%*

c.) I would be willing to document the causes and recommend interventions to other agencies if these agencies would work with the seniors to help reduce their likelihood of injury. TRUE FALSE

91% *8%* *no answer: 1%*

Rate the following causes of falls to seniors from 5 to 1, with 5 being the most frequent and 1 the least frequent, use 0 if it is not a factor

*3.45*__Environmental hazards (includes rugs, cords, stairs, poor lighting)
*3.76*__Weakness
*2.56*__Orthostatic hypotension (gets dizzy standing up)
*2.02*__Side effects of prescription drugs (individually or in combination)
*2.07*__Gait dysfunction
*3.06*__Cognitive impairment (vision, awareness and judgment)
*2.89*__Disability of lower extremities and foot problems
*2.82*__Balance problems
*1.74*__Alcohol abuse

The people who would best be able to make a difference in reducing fall injuries to seniors are _*See APPENDIX D*_____.

Circle your rank in the Fire Department : CAPTAIN *(14)* ENGINEER *(15)* FIREFIGHTER *(29)* PARAMEDIC CAPTAIN *(2)* FIREFIGHTER/PARAMEDIC *(26)*

Is there another area of injury prevention that the HFD should focus on?

*See APPENDIX D*_____

_____

Do you have any comments on this survey?

*See APPENDIX D*_____

_____

APPENDIX C: A Distribution of the Frequency of Responses for Fall Factors

	0	1	2	3	4	5			
	no factor	rarely	occassionally	sometimes	often	usually	total score	mean score	rank
Environmental hazards	4	6	11	19	16	31	304	3.45	2
Weakness	0	1	10	23	19	33	331	3.76	1
orthostatic hypotension	3	17	21	26	12	8	225	2.56	6
drug effects	12	21	21	19	12	2	178	2.02	8
Gait	10	25	23	15	9	6	182	2.07	7
cognitive impairment	2	7	16	27	26	9	269	3.06	3
foot problems	8	7	20	18	17	17	254	2.89	4
Balance	3	14	16	20	28	6	248	2.82	5
alcohol/drug use	14	32	16	14	8	3	153	1.74	9

APPENDIX D: Responses to Open Ended Survey Questions

Responses to the Statement: "The people who would best be able to make a difference in reducing fall injuries to seniors are" (number of mentions in parenthesis):

Family (39)
Caregivers/Caretakers (17)
Self (13)
Emergency Workers (5)
Doctors (4)
Nurses (4)
Senior Center (2)
Public Interest Group (1)
Social Service Group (1)
Fire Prevention Injury Specialist (1)
Qualified Personnel (1)
AARP (1)
TV Producers (1)
PSAs (1)
Commercials (1)
Anyone with time (1)
All of us (1)
Delivery Person (1)

Responses to the Question: "Is there another area of Injury prevention that the HFD should focus on?"

Children's chest X-ray
Bicycle safety (2)
Seat belt awareness (7)
Bicycle helmets (2)
Pull right for emergency vehicles
Seniors in motor vehicle accidents (MVAs)
Back injuries
Fire Department work related injuries (5)
Car seat awareness
Preventable child trauma, (child safety), playgrounds (9)
Public safety announcements
Pool safety (2)
Smoke detectors
Home hazards-housekeeping, trip hazards, fire hazards (2)
Neighborhood safety survey
Exercise, nutrition, alternative medicine
Domestic violence/abuse (2)
Vehicle safety
Appropriate 911 use
Referral list/training needs for seniors
Personnel
Weight room injuries
Driving under the influence/Motor vehicle accidents
Use department statistics to identify areas
MVA
Bathroom safety
Violence
Driver awareness
Y2K
Nuclear emergency and you
Africanized bees

Categories:
Auto-15
Child: 12
Home: 6
F D job injuries: 6
Violence/Abuse: 5
Bicycle: 4
Pool safety: 2

Responses to the Question: "Do you have any comments on this survey?"

	Be more specific about the causes of falls
	I don't have enough knowledge/expertise to answer knowledgeably
	Senior population growth means greater EMS demand
+	Very interesting
+	Sounds excellent to build goodwill with the public
	Drug/alcohol awareness
+	Made me think about injury prevention to seniors & what I can do about it
+	Excellent community service topic (2)
+	Excellent for seniors and the fire department
+	Use senior center for the initial education, expand into the homes with home health care. Grants for home modifications (2)
-	Questions slanted
	Include in survey a section of ideas fir injury prevention for seniors
+	Good survey (3)
	Develop self-home hazard survey form
	Good luck
	Like to see results
	It's only my <u>opinion</u>
	Environmental hazard training, assistance, inspections (1 each)
+	Good idea are you thinking of a program

APPENDIX E: Henderson Population Figures

Population and Senior Population over the Last Five Years							
Year	**City Population**	**Population 55 years to 64 years**	**% of Population Total**	**Population 65 years and over**	**% of Population Total**	**Population 55 years and over**	**% of Population Total**
1998	159,332	24,958	16%	24,312	15%	49,270	31%
1997	146,357	23,162	16%	20,846	14%	44,008	30%
1996	132,560	19,685	15%	16,754	13%	36,439	27%
1995	117,933	15,069	13%	13,095	11%	28,164	24%
1994	108,158	15,308	14%	12,213	11%	27,521	25%
1993	94,636	12,302	13%	9,464	10%	21,766	23%
Sources:	*Population Estimates - City of Henderson, Community Development Department*						
	Senior Population Estimates - Las Vegas Perspective						
Prepared by:	City of Henderson, Community Development Department						
	Telephone: (702) 565-2474						